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# मानक

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IS 6994-1 (1973): safety gloves, Part 1: Leather and cotton gloves [CHD 8: Occupational Safety, Health and Chemical Hazards]



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“Knowledge is such a treasure which cannot be stolen”



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IS : 6994 ( Part 1 ) - 1973  
( Reaffirmed 2007 )

*Indian Standard*  
SPECIFICATION FOR  
INDUSTRIAL SAFETY GLOVES  
**PART 1 LEATHER AND COTTON GLOVES**

( Sixth Reprint JULY 1999 )

UDC 614 896 2

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**BUREAU OF INDIAN STANDARDS**  
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG  
NEW DELHI 110002

**Gr 5**

*January 1974*

**AMENDMENT NO. 1    AUGUST 1979**

**TO**

**IS:6994(Part I)-1973 SPECIFICATION FOR  
INDUSTRIAL SAFETY GLOVES**

**PART I    LEATHER AND COTTON GLOVES**

**Alteration**

(*Page 16, clause 13.3*) - Substitute the following  
for the existing clause:

'13.3 Dimensions — Same as in 10.4, except that for  
gloves with knitted fabric cuff, outside dimension  
across the cuff opening shall be 80 to 90 mm.'

**Addendum**

(*Page 17, clause 14.4*) — Add the following new note  
after 14.4:

NOTE - The outside dimension across cuff opening  
shall be 30 to 90 mm in the the of gloves with  
fabric cuffs.'

**AMENDMENT NO. 2    APRIL 1982**

**Alteration**

(*Page 16, clause 13.4, line 3*) - Substitute '50 mm,  
*Min'* for 51 to 152 mm'.

# *Indian Standard*

## SPECIFICATION FOR INDUSTRIAL SAFETY GLOVES

### PART I LEATHER AND COTTON GLOVES

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(Continued on page 1)

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*Indian Standard*  
SPECIFICATION FOR  
INDUSTRIAL SAFETY GLOVES  
PART I LEATHER AND COTTON GLOVES

**0. FOREWORD**

**0.1** This Indian Standard (Part I) was adopted by the Indian Standards Institution on 25 April 1973, after the draft finalized by the Leather Sectional Committee had been approved by the Chemical Division Council

**0.2** Safety gloves, gauntlets, mitts and hand guards are used by workers in various industries to protect their hands and portion of the arms against common industrial hazards. For the guidance of the user, the type of gloves, gauntlets, mitts and hand guards considered most suitable for certain common industrial hazards are given in Appendix A. The number of varieties have been reduced to minimum. It is hoped that the canalization of demand for gloves into these preferred type and sizes will facilitate economic production and provide for the greatest economy in use. However, asbestos gloves and gloves giving protection against electric shock are not covered in this standard.

**0.3** The gloves specified fall into four broad groups — leather, plastics, rubber and cotton. The sizes for gloves of leather or cotton are similar since they are based on a common background of development. The sizes of rubber and plastics gloves differ from the remaining groups because these gloves were developed in a separate industry and it is not possible to reconcile this difference at present without causing hardship to one industry, because of the consequent change in plant. In this part, Leather gloves, gauntlets, mitts and hand guards have been covered. Rubber and plastics gloves will be covered in Part II and Part III respectively.

**0.4** While preparing this standard, considerable assistance has been drawn from the following standards.

AS Z/ 4-1963 Industrial safety gloves and mittens. Standards Association of Australia

S A B S 316-1957 Specification for industrial gloves, gauntlets, mitts and hand-guards. South African Bureau of Standards.

BS 1631-1966 Specification for industrial gloves. British Standards Institution

ASAL IS 7-12-1944 Asbestos and asbestos gloves and mittens (American War Standard — American National Standards Institution, Inc.



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0.5 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2-1960\*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard

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### 1. SCOPE

1.1 This standard (Part 1) the requirements and the methods of sampling and test for a range of preferred types of leather and cotton gloves, gauntlets, mitts and hand guards for protection against common industrial hazards

1.2 This standard does not cover asbestos industrial gloves, used by the medical profession and gloves used for protection against electrical hazards.

### 2. TERMINOLOGY

2.1 For the purpose of this standard, the following definitions and the definitions given in IS 164-0-1960† shall apply

2.1.1 *Cuff* — Extension of a glove, gauntlet or mitt which covers the wrist or arm.

2.1.2 *Full-Arm Gauntlets* — A covering for the hand having separate fingers and thumb with cuff length greater than 300 mm but not exceeding 400 mm.

2.1.3 *Gauntlet* — A covering for the hand having separate fingers and thumb with cuff length greater than 63.5 mm but not exceeding 300 mm.

2.1.4 *Glove* — A covering for the hand having separate fingers and thumb with cuff length not greater than 63.5 mm

2.1.5 *Gunn Pattern* — A pattern of the four-finger and thumb design, having the face of the thumb, the palm and first (index) and fourth (little) fingers made of one piece of material. The back is of one piece up to the cuff and includes the backs of the four fingers at least. The fronts of the second and third fingers may be one piece each, jointed to the palm at the base of appropriate fingers. (see Fig. 1).

2.1.6 *Hand Guards* — A piece of protective material of various designs used to protect the hand

2.1.7 *Mitt* — A covering for hand with separate thumb and a common covering for the fingers.

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\*Rules for rounding off numerical values ( revised

†Glossary of terms relating to index, skin and leather

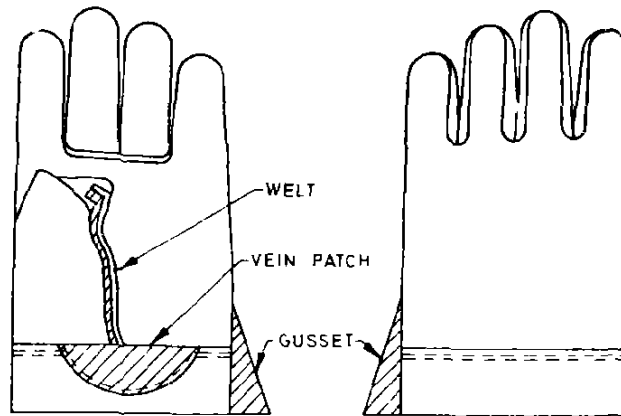


FIG 1 GROVES OF THE GUNN PATIERN

**2.1.8 Clute Pattern** — Gloves of the four fingers and thumb design having a onc-picccc palm including the front of all four fingers and the back of the index finger also (see Fig. 2). The seam on the back of the hand may be an out-seam or an inseam.

**2.1.9 Montpelier Vallern** — The Montpelier pattern shall be of the four

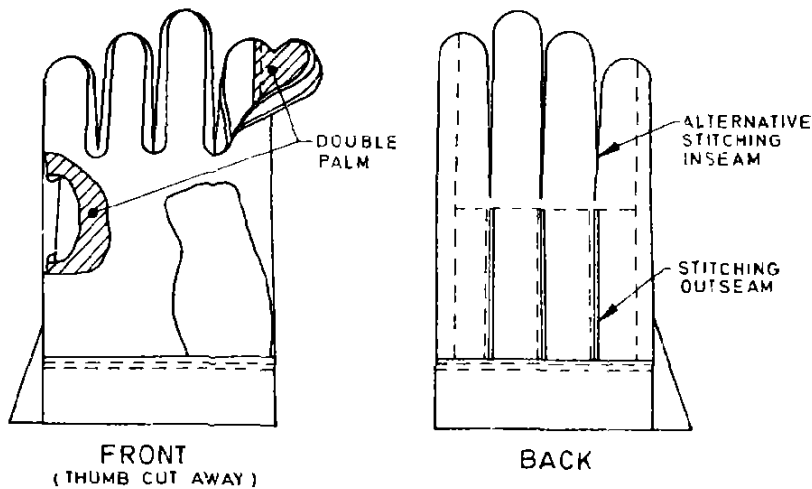


FIG. 2 GLOVES OF THE CLUTE PATFRN

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fingers and thumb design having the front and all four fingers of one piece and the back of the gloves and gauntlet and back of all four fingers of one piece. There shall be one-piece fourchettes between the first and second, second and third, and third and fourth fingers (see Fig 3)

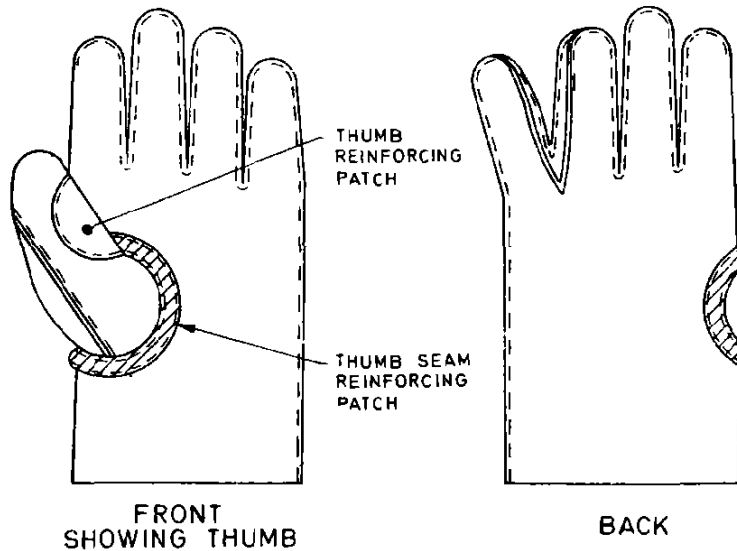


Fig 3 GLOVES OF THE MONTPELIER PATTERN

**2.1.10 One-Finger Mitt** — A covering for the hand having a separate thumb and index finger and a common covering for the remaining fingers.

**2.1.11 Reinforcement** — An extra thickness of material attached to portions of the gloves to meet a particular requirement.

**3. TYPES**

**3.1** This standard covers only 11 of the 19 types of industrial gloves mentioned below, the rest being included in Parts II and III.

- Type 1 — Chrome leather gloves,
- Type 2 — Chrome leather inseam mitts and one-finger mitts;
- Type 3 — Chrome leather gauntlet.
- Type 4 — Chrome leather inseam gauntlet with canvas or leather cuffs, with or without reinforcement between thumb and forefinger;
- Type 5 — Chrome leather stapled double-palm gloves;
- Type 6 — Chrome leather inseam gauntlet with vein patches and aprons covering palm to first joint of fingers;
- Type 7 — Chrome leather back and palm, inseam gloves,

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- Type* 8 — Chrome leather felt-lined (thumb only), mitts with canvas or leather faced palms;
- \**Type* 9 — Lined polyvinyl chloride gloves and gauntlet.
- \**Type* 10 — Unlined polyvinyl chloride gloves gauntlet
- †*Type* 11 — Unlined light-weight rubber gloves and gauntlet,
- †*Type* 12 — Unlined medium-weight rubber gloves and gauntlet,
- †*Type* 13 — Unlined heavy-weight rubber gloves and gauntlet,
- Type* 14 — Chrome leather hand guards;
- Type* 15 — Cotton drill gloves,
- Type* 16 — Cotton drill gloves with chrome leather palms;
- †*Type* 17 — Lined light-weight rubber gloves and gauntlet;
- †*Type* 18 — Lined medium-weight rubber gloves and gauntlet, and
- †*Type* 19 — Lined heavy-weight rubber gloves and gauntlet.

**4. REQUIREMENTS FOR TYPE 1**

**4.1 Material**

**4.1.1 Leather**— Chrome tanned raw or young buffalo grain or split leather to conform to the following requirements.

- a) The Leather and flesh split shall be of natural colour having thickness of 1.0 to 2.0 mm and 1.1 to 2.0 mm respectively,
- b) It shall be soft, pliable and free from flaws or loose fibres,
- c) It shall be treated in such a manner as shall not obscure defects and such that It shall not be stained with compounds of iron;
- d) In case of grain leather, it shall not crack on the grain side when bent round a mandrel of 1.5 mm. diameter, through an angle of 180 degrees.
- e) It shall comply with the requirements given in Table 1;
- f) The leather shall not contain any chromate extractable by water or dilute acids, and
- g) The leather should also be treated for mildew resistance.

**4.1.2 Thread** — Cotton sewing thread conforming to Varrety No 23 of IS : 1720-1969: shall be used.

**4.2 Size** — The gloves shall be tested for size and shall be on a glove non the minimum palm circumference of which is 254 mm for men's gloves and 216 mm for women's gloves. the circumference of the fingers and the thumb shall be proportional to the circumference of the palm subject to normal allowance being made for finger joints, seams, and thickness of leather between the fingers.

**4.2.1** For sizes larger than the minimum mentioned above, agreement should be reached between the purchaser and the supplier.

\*Will be covered in Part II

†Will be covered in Part III

‡Specification for cotton sewing thread (first revision).

TABLE 1 REQUIREMENTS OF LEATHER

| SL No. | CHARACTERISTIC   | REQUIREMENT   | METHOD OF TEST, REF TO CL NO. |
|--------|--|---------------|-------------------------------|
| (1)    | (2)  | (3)           | (4)                           |
| i)     | Petroleum hydrocarbon soluble matter, percent by mass. <i>Max</i>                  | 5             | LC . 4 of IS : 582-1970*      |
| ii)    | Chromium content (at Cr <sub>2</sub> O <sub>3</sub> ), percent by mass. <i>Min</i> | 2 5           | LC . 10 of IS - 582-1970*     |
| iii)   | pH of aqueous extract  | Not below 3 5 | L.C. 18 or IS . 582-1970*     |
| iv)    | Double hole stitchtear strength, kg/cm, <i>Min</i>                                 | 50            | LP . 8 of IS : 5914-1970†     |
| v)     | Shrinkage temperature, °C, <i>Min</i>  | 90            | L.P. 10 of IS . 5914-1970†    |

\*Methods of chemical testing of leather (*first revision*).

†Methods of physical testing of leather.

**4.3 Design and Dimensions** — The gloves shall be of either the Clute pattern or the Gunn pattern or the Montpeher pattern. The minimum outside dimensions of the gloves shall be as follows:

| <i>Dimension</i>                            | <i>Men's</i><br>mm | <i>Women's</i><br>mm |
|---|--------------------|----------------------|
| Overall length to tip of second finger      | 254                | 229                  |
| Across palm at crotch of thumb              | 121                | 114                  |
| From tip of index finger to crotch of thumb | 127                | 121                  |
| From tip of thumb to crotch of thumb        | 76                 | 64                   |
| Across opening of glove                     | 140                | 127                  |

**4.4 Stitching** In the case of Clute and Gunn patterns, the glove may be either the inscam or outseam type. In the case of Montpelier pattern, the glove shall be the outseam type. There shall be 6 to 8 stitches per 25 mm with the end of all stitching securely back-stitched. All stitches shall be joined together by a double row of stitching. The completed glove shall be of the inseam type with the stitching on the fingers and the thumb on the inside as a protection.

**4.5 Reinforcement** — Reinforcement shall be provided between the thumb and the index finger, to cover the whole of the palmside of the thumb extending the whole length of the index finger and shall be securely sewn down.

## 5. REQUIREMENTS FOR TYPE 2

### 5.1 Material

**5.1.1 Leather** — Chrome tanned spht complying with the requirements specified in 4.1.1

**5.1.2 Thread** — It shall comply with the requirements specified in 4.1.2

## 5.2 Design

**5.2.1 Pattern** — The pattern shall be the mitt or one-finger mitt and thumb design. The front and back of the mitt shall be cut from one piece of leather. A third piece may be used as a gusset between the index finger and the body of the mitt.

**5.2.2 Thumb** — The thumb shall be cut from one piece of leather with the seam running down the back of the thumb. The thumb seam joining the thumb to the mitt shall be of the welted inseam type.

**5.2.3 Gusset** — A triangular gusset of leather, not longer than 90 mm and not wider than 65 mm, may be inserted into the sideseam in the mitts.

**5.3 Dimensions** — The recommended outside dimensions of the mitt (see Fig. 4) shall be as follows.

| Reference Letter and Explanation         | Dimension |              |
|--|-----------|--------------|
|  | Min<br>mm | Max<br>mm    |
| Length of thumb, <i>A</i>                | 64        | 75           |
| Crotch of thumb to end of mitt, <i>B</i> | 125       | 137          |
| Across palm at crotch of thumb, <i>C</i> | 114       | 125          |
| Across cuff opening at wrist, <i>D</i>   | 121       | 133          |
| Length of mitt, <i>E</i>                 | 254       | as specified |

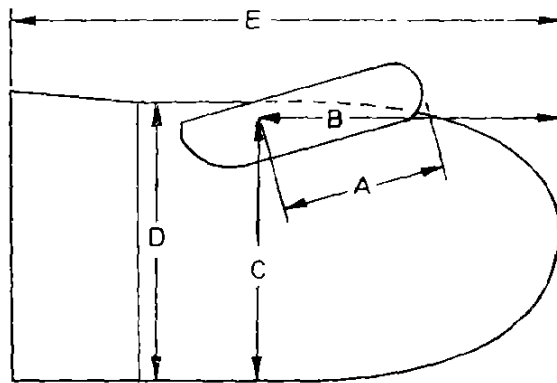


FIG. 4 LEATHER MITT

**5.4 Stitching** — The mitt shall be of the inseam type with the stitching on the finger, mitt and thumb seams on the inside as a protection. The stitches shall be lock-stitch or double-thread chain stitch type, the number of stitches being 6 to 8 per 25 mm. The loose end of the thread shall be securely back-stitched.

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## 6. REQUIREMENTS FOR TYPE 3

### 6.1 Material

**6.1.1 Leather**—Chrome tanned split leather conforming to the requirements prescribed in 4.1.1.

**6.1.2 Thread**— same as in 4.1.2

**6.1.3 Stitching Wire** — Galvanized mild steel wire 1 02 0 71 mm for stitching and 2 64 × 0.51 mm for stapling, shall be used

**6.2 Design** — The gauntlet shall be of the Clute, the Gunn or the Montpelier pattern. In the case of Gunn and Clute patterns the cuffs shall be made of two pieces of leather, that is, front and back; ??? pattern, the cuffs may be in continuation of the palm and the back in one piece.

**6.3 Size** — same as in 4.2.

**6.4 Dimensions** — The gauntlets shall have the following minimum outside dimensions

| <i>Dimension</i>                             | <i>Men's</i> | <i>Women's</i> |
|--|--------------|----------------|
|  | mm           | mm             |
| From top of cuff to tip of second finger     | 315          | 305            |
| From bottom of cuff to tip of second finger  | 203          | 184            |
| Cuff length                                  | 102          | 95             |
| From tip of index finger to crotch of thumb  | 127          | 121            |
| From tip of thumb to crotch of thumb         | 76           | 64             |
| Across palm at crotch of thumb               | 121          | 108            |
| Across cuff-opening                          | 178          | 159            |
| Across bottom of gauntlet cuff at wrist seam | 127          | 114            |

**6.5 Stitching** — In the case of Clute and Gunn patterns, the glove shall be of the inseam type with the stitching on the fingers and thumb on the inside as a protection. Clute pattern gloves may be of the outseam type when wire stitched. In Montpelier pattern, the stitching shall be the outseam type. All stitching shall be of lock-stitch or double-thread chain-stitch type, with the ends securely back-stitched. There shall be 6 to 8 stitches per 25 mm. Wire stitching shall be done with stitching wire specified in 6.1.3 and the number of stitches shall be according to good manufacturing practice

## 7. REQUIREMENTS FOR TYPE 4

### 7.1 Material

**7.1.1 Leather** — same as in 4.1.1.

**7.1.2 Thread**—same as in 4.1.2.

**7.1.3 Canvas** — Cotton canvas, undyed 403 g/m<sup>2</sup> shall be used (for the cuff).

**7.2 Design**

**7.2.1 Pattern** — The gauntlets shall be of the Clute pattern.

**7.2.2 Cuffs** — The cuffs shall consist of either canvas or leather in two pieces, that is front and back, each piece 114 mm deep, joined together by a double row of sewing, and sewn on to the glove by a double row of stitching.

**7.3 Size** — same as in 4.2.

**7.4 Dimensions** — Same as in 6.4.

**7.5 Reinforcement** — Where reinforcement is provided between the thumb and the index finger, the reinforcement shall cover the whole of the palm side of the thumb extending the whole length of the index finger and shall be securely sewn down.

**7.6 Stitching** — The glove shall be the inseam type, with the stitching on the finger and the thumb on the insides as protection. The gauntlet shall be stitched with thread specified in 4.1.2 and shall be of the lock-stitch type, the number of stitches being 6 to 8 stitches per 23 mm. All loose ends of stitching thread shall be securely fastened off.

**8. REQUIREMENTS FOR TYPE 5****8.1 Material**

**8.1.1 leather** — Chrome tanned split leather conforming to the requirements specified in 4.1.1.

**8.1.2 Thread** — same as in 4.1.2

**8.1.3 Stitching Wire and Staple** — same as in 6.1.3.

**8.2 Design** — The gloves shall be of either the Clute pattern or the Montpelier pattern. The thumb in the Clute pattern shall be of the two-piece type, protected with steel staples, and with a protective leather welt round the base of the thumb seam. In Montpelier pattern, the thumb shall be of the butterfly type, protected with steel staples. There shall be a reinforcing welt covering the seam joining the thumb to the glove.

**8.3 Size** — same as in 4.2.

**8.4 Dimension**

**8.4.1 Clute Pattern** — The minimum outside dimensions shall be as follows:

| <i>Dimension</i>                            | <i>mm</i> |
|---|-----------|
| From top of groove to tip of second finger  | 254       |
| Across palm at crotch of thumb              | 133       |
| From tip of index finger to crotch of thumb | 133       |
| From tip of thumb to crotch of thumb        | 76        |
| Across cuff-opening                         | 133       |



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**8.4.2 Monlpelier Pattern** — The minimum outside dimensions shall be as follows:

| <i>Dimension</i>                                | <i>mm</i> |
|---|-----------|
| From tip of glove to tip of second finger       | 254       |
| From top of double palm to tip of second finger | 191       |
| Across palm at thumb crotch                     | 133       |
| From tip of index finger to crotch of thumb     | 127       |
| From tip of thumb to crotch of thumb            | 76        |
| Across opening at top of glove                  | 133       |

**8.5 Stitching** — The glove shall be stitched with the wire (*see 8.1.3*) except that the fourchettes of the Clute pattern gloves may be stitched with thread reinforced with wire and the cuffs may be attached in the same manner. The number of stitches shall be 6 to 8 per 25 mm.

**8.6 Stapling** — The gloves shall be reinforced with the galvanized mild steel staples (*see 8.1.3*). The stapling may be applied diagonally or horizontally to the palm and finger, but shall consist of rows of staples running from the tips of the fingers to the seam joining the cuff. There shall be two rows of staples running down each finger and across the palm to the cuff, with an additional row from the first of each finger to the cuff, and three rows on the index finger, on the side nearest to the thumb. The long axis of the staples shall be not less than 3.2 mm and not more than 6.4 mm apart so that there shall be approximately  $1\frac{1}{2}$  to  $1\frac{3}{4}$  staples/cm<sup>2</sup> throughout the area of armouring. All staples shall be firmly clenched.

## 9. REQUIREMENTS FOR TYPE 6

### 9.1 Material

**9.1.1 Leather** — Chrome tanned grain leather and chrome tanned flesh split leather, both conforming to the requirements prescribed in **4.1.1**.

**9.1.2 Thread** — same as in **4.1.2**.

### 9.2 Design and Size

**9.2.1 Pattern** — The gaunflets shall be of the Clute pattern.

**9.2.2 Dimension** — same as in **6.4**.

**9.2.3 Size** — same as in **4.2**.

**9.2.4** The leather on the palm, thumb, apron front vein pad and the back of the index finger shall be from grain leather specified in **4.1.1**. The back of the second, third and fourth fingers and the cuff shall be of chrome split leather, specified in **4.1.1**. Alternately, the whole of the gauntlet may be of chrome grain leather with, cuffs of splits.

**9.2.5 Cuffs** — The cuffs shall consist of two pieces of leather, that is, front and back, joined together by a double row of sewing, and sewn on to the glove by a double row of stitching.

**9.3 Stitching** — The gauntlets shall be of the inseam type, the stitching on the finger and the thumb being on the inside as a protection. The stitching shall be the lock-stitch type with 7 to 9 stitches per 25 mm. All loose ends of stitching thread shall be securely fastened off.

## 10. REQUIREMENTS FOR TYPE 7

### 10.1 Material

**10.1.1 Leather** — Chrome tanned grain and flesh split leather conforming to the requirements given in 4.1.1.

**10.1.2 Thread** — same as in 4.1.2.

**10.2 Design** — The gloves shall be either of the Clute pattern or the Gunn pattern. In the case of Glute pattern, the palm, the fronts of the fingers, the back of the index finger and the whole of the thumb shall be of chrome tanned leather (*see* 4.1.1). The back of the second, third and fourth fingers shall be chrome tanned splits. In the case of Gunn pattern, the palm and the fronts of the fingers shall be of chrome tanned leather (*see* 4.1.1). The back shall be chrome tanned splits, of one piece and shall include the backs of the four fingers up to the cuff. The cuff in both the patterns shall consist of a maximum of two pieces of leather having a minimum width of 50 mm. There shall be a leather gusset, not less than 50 mm wide and not more than 95 mm long inserted at the side seam of the gloves and joined to the cuff. The cuff shall be joined to the glove by a double row of stitching.

**10.3 Size** — same as in 4.2.

**10.4 Dimensions** — Gloves shall have the following minimum outside dimensions.

| <i>Dimension</i>                             | <i>Men's</i><br>mm | <i>Womn's</i><br>mm |
|--|--------------------|---------------------|
| From top of cuff to tip of second finger     | 254                | 229                 |
| From bottom of cuff to tip of second finger  | 203                | 184                 |
| Cuff length                                  | 50                 | 44                  |
| From tip of index finger to crotch of thumb  | 127                | 121                 |
| From tip of thumb to crotch of thumb         | 76                 | 64                  |
| Across palm at crotch of thumb               | 121                | 108                 |
| Across cuff-openmg                           | 127                | 114                 |
| Across bottom of gauntlet cuff at wrist seam | 127                | 108                 |

**10.5 Stitching** — In both patterns, the glove shall be of the inseam type on the front and the outseam type on the back with the stitching on the fingers and on the thumb on the inside as a protection. All stitching shall be of the lock-stitch type, the number of stitches being 6 to 8 stitches per 25 mm.

**10.6 Vein Patch** — There shall be a vein patch (a semi-circular piece) of chrome tanned leather sewn midway in the palm of the glove at the cuff seam and sewn on the cuff. The patch shall be not less than 76 mm in diameter.

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**11. REQUIREMENTS FOR TYPE 8**

**11.1 Material**

**11.1.1 *Leather*** - - Chrome tanned split leather complying with the requirements given in 4.1.1.

**11.1.2 *Thread*** — same as in 4.1.2

**11.1.3 *Felt*** — The felt shall have a nominal composition of 75 percent wool and 25 percent vegetable fibre. The felt shall be sterilized against anthrax. It shall be white grey, 4.8 to 6.4 mm thick under a static dead load of 2.18 g/cm<sup>2</sup>, milled pressed but neither woven nor needled. The mass of felt after conditioning at 27 ± 2°C and 65 ± 2 relative humidity for 24 h shall be 950 g/m<sup>2</sup> (with a tolerance of ± 10 percent).

**11.1.4 *Canvas*** — same as in 7.1.3.

**11.2 Design and Dimensions**

**11.2.1 *Pattern*** — The pattern shall be an outseam mitt with thumb only. The palm, cuff and thumb shall be made of one piece of leather. The back of the mitt, cuff and thumb shall be made of one piece of canvas or leather.

**11.2.2 *Leather*** — The mitt shall be lined on the inside with felt.

**11.2.3 *Dimensions*** — The dimensions of the mitt shall be as given in 11.3.

**11.3 Reinforcement** — The reinforcement shall cover the palm and extend 38 mm round over the back of the index finger, extend 235 mm from tip of mitt, and shall cover the whole thumb. Dimensions may be altered to suit customer's requirements.

**11.4 Stitching** — Stitching shall be double sewn at all places with the thread specified in 11.1.2, the number of stitching being 7 to 9 stitches per 25 mm. All loose ends shall be securely back-stitched.

**12. REQUIREMENTS FOR TYPE 14**

**12.1 Material**

**12.1.1 *Leather*** — Chrome tanned, complying with the requirements given in 4.1.1.

**12.1.2 *Thread*** — same as in 4.1.2.

**12.1.3 *Canvas*** — same as in 7.1.3.

**12.2 Pattern and Design**

**12.2.1** The hand guards shall have a one-piece palm and thumb (if required). The finger-tip side of the hand guards shall be rounded off.

**12.2.2** The design of hand guards shall be as agreed to between the purchaser and the supplier. The hand guards shown in Fig. 5 are recommended.

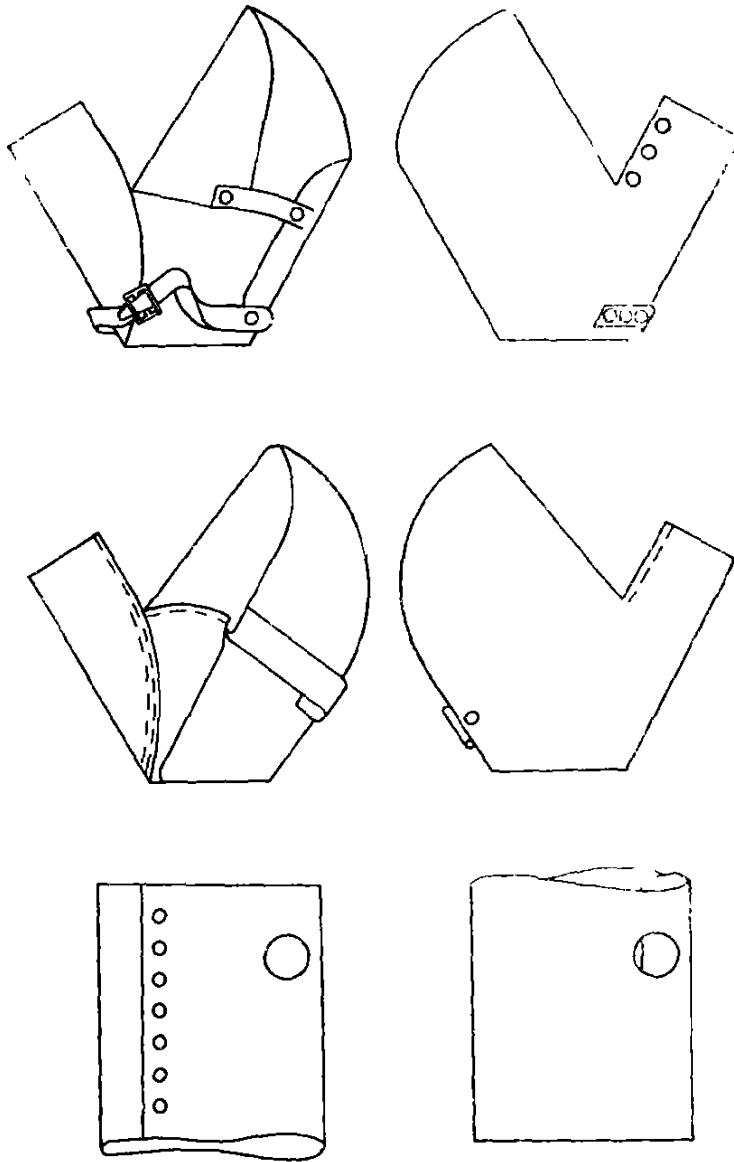


FIG. 5 TYPICAL HAND GUARD

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**12.2.3 Lining** — The hand guards shall be provided with a lining of canvas throughout (see 7.1.3)

**12.3 Dimensions**

**12.3.1 Length** — The hand guards shall be not less than 216 mm long if intended for protection to the palm only.

**12.3.2 Width** — Hand guards provided with separate thumb shall be not less than 100 mm wide at the palm and 38 mm at the thumb. Hand guards without a separate thumb shall be not less than 125 mm wide.

**12.3.3** Hand guards shall be provided with stitches or straps or both to fit respectively round the wrist or index fingers or round both.

**12.4 Seams and Stitching** — The leather hand guards shall be joined where necessary with suitable bifurcated rivets or by lock stitching with threads complying with the requirements specified in 12.1.2. Stitched seams shall be reinforced by stapling with galvanized steel wire (see 6.1.3); when stitched there shall be not less than 6 and not more than 8 stitches per 25 mm with the ends of all stitching securely back-stitched.

**13. REQUIREMENTS FOR TYPE 15**

**13.1 Material**

**13.1.1 Cotton Drill** — Cotton drill shall be unbleached 315 g/m<sup>2</sup> with a tolerance of 19 g/m<sup>2</sup>.

**13.1.2 Knitted Fabric for Cuffs** — 2/20 all cotton.

**13.1.3 Threads** — same as in 4.1.2.

**13.2 Design**

**13.2.1 Patterns** — The gloves shall be of either the Clute pattern or the Gunn pattern.

**13.2.2 Size** — same as in 4.2.

**13.3 Dimensions** — same as in 10.4.

**13.4 Guffs** — Cuffs in both the patterns shall be either cotton drill cuff, 51 to 152 mm deep, the edges of which shall be hemmed; or a knitted cuff, 51 to 152 mm deep for men's protective gloves and 51 to 127 mm deep for women's protective gloves. The knitted cuffs shall be double, and sewn to the bottom edges of the gloves.

**13.5 Stitching** — The glove shall be of the inseam type with the stitching on the inside as a protection. All stitching shall be of lock-stitch type with the thread specified in 13.1.3 and there shall be 6 to 8 stitches per 25 mm. The ends shall be securely back-stitched.

**14. REQUIREMENTS FOR TYPE 16****14.1 Materials**

**14.1.1 Leather** — Chrome tanned leather conforming to the requirements prescribed in 4.1.1.

**14.1.2 Cotton Drill** — same as in 13.1.1

**14.1.3 Knitted Fabric** — same as in 13.1.2

**14.1.4 Thread** -- same as in 4.1.2.

**14.2 Design** — These gloves shall be of the Clute pattern. The back of fingers and the cuff, if required, shall be made of cotton drill. The palm, front of fingers, back of the index finger and the whole of the thumb shall be made of leather (*see* 14.1.1). The cuffs shall be either of cotton drill, 30 mm deep, the edge of which shall be hemmed, or knitted cuff 51 to 152 mm deep for men's gloves and 51 to 127 mm deep for women's gloves. Knitted cuffs shall be doubled, and sewn to the bottom edges of the gloves.

**14.3 Size** — same as in 4.2

**14.4 Dimensions** — Gloves shall have the following minimum outside dimensions.

| <i>Dimension</i>                            | <i>Mens</i><br>mm. | <i>Women's</i><br>mm |
|---|--------------------|----------------------|
| From top of Cuff to tip of second finger    | 254                | 229                  |
| From bottom of cuff to tip of second finger | 203                | 184                  |
| Cuff length                                 | 51                 | 44                   |
| From tip of forefinger to crotch of thumb   | 127                | 121                  |
| From tip of thumb to crotch of thumb        | 76                 | 64                   |
| Across palm at crotch of thumb              | 121                | 108                  |
| Across cuff-opening                         | 127                | 114                  |

**14.5 Stitching** — The glove shall be of the inseam type with the stitching on inside as a protection. All stitching shall be of the lock-stitch type with the thread specified in 14.1.4 and there shall be 7 to 9 stitches per 25 mm. The ends shall be securely back-stitched.

**15. WORKMANSHIP AND FINISH**

**15.1** In appearance, general workmanship and finish, and in all other respects not defined in this specification, the gloves, gauntlets, mitts and hand guards shall also conform to the approved sample

**16. MARKING AND PACKING**

**16.1 Marking** — The gloves shall be legibly stamped on the inside of the cuff with the following information:

- a) The manufacturer's name or recognized trade-mark;
- b) The type and nominal size of the gloves,

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- c) Year of manufacture, and
- d) Where applicable, the words 'light mass', 'medium mass', or 'heavy mass'

**16.1.1** The gloves may also be marked with the Standard Mark

NOTE — The use of the Standard Mark is governed by the provisions of the Bureau of Indian Standards Act, 1986 and the Rules and Regulations made thereunder. The Standard Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well defined system of inspection, testing and quality control which is devised and supervised by BIS and operated by the producer. Standard marked products are also continuously checked by BIS for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

**17. SAMPLING AND CRITERIA FOR CONFORMITY**

**17.1** The scale of sampling and criteria for conformity of gloves, gauntlets, mitts and hand guards shall be as agreed to between the purchaser and the supplier

**A P P E N D I X     A**

( Clause 0.2 )

**RECOMMENDED MATERIALS OF INDUSTRIAL SAFETY  
GLOVES, GAUNTLETS, MITTS AND HAND GUARDS**

**A-1. RECOMMENDED TYPES OF INDUSTRIAL GLOVES**

**A-1.1** The following types of industrial gloves, gauntlets, mitts and hand guards are recommended for use against industrial hazards indicated in Table 2

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**TABLE 2 RECOMMENDED INDUSTRIAL GLOVES**

| S.L.<br>No. | PROTECTION AGAINST  | ??? OPERATION   | RECOMMENDED TYPE<br>OF GLOVES |
|-------------|---|---|-------------------------------|
| (1)         | (2)   | (3)   | (4)                           |
| i)          | Heat, but wear not serious and no irritant substance presents | ??? work, droup-<br>??? casting and<br>forging, handling hot<br>??? and similar operation | 1, 2, 3, 4, 8                 |

( Continued )

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TABLE 2 RECOMMENDED INDUSTRIAL GLOVES—Contd

| SL No. | PROTECTION AGAINST  | TYPICAL OPERATION   | RECOMMENDED TYPE OF GLOVES   |
|--------|---|---|--|
| (1)    | (2)   | (3)   | (4)  |
| ii)    | Heat, when wear more serious or irritant substances present   | Stoking gas retorts, riveting, holding up, hot chipping                                       | 2, 3, 8  |
| iii)   | Heat, when fair degree of sensitivity is required and splashes or spatter of molten metal may occur | Welding case hardening in cyanide bath  | 2, 3, 4  |
| iv)    | Sharp materials or objects  | Swarf, metal after guillotining, blanking or machining  | 2, 4, 6, 8, 9*, 13A†, 13A (R)†, 14, 19A†                                       |
| v)     | Sharp materials or objects in an alkaline degreasing bath   | —   | 9*, 10*, 13A†, 13A (R)†, 18BC†, 19BG†  |
| v.)    | Glass or timber with splintered edges   | —   | 14, 16   |
| vii)   | Abrasion  | Handling cold castings or forgings precast, concrete, bags of cement and bricks               | 2, 5, 7, 9*, 11A (R)†, 12†, 12AG†, 13AC†, 14, 16, 17AC†, 18AC†, 19AG†          |
| viii)  | Gross abrasion  | Shot blasting   | 2, 8, 11A (R)†, 12A (R)†, 13A†   |
| ix)    | Light abrasion  | Light handling operations   | 1, 2, 8, 9*, 11ABC†, 12ABG†, 14, 15, 16  |
| x)     | Chemicals   | Acids, alkalis, dyes and general chemical hazards not involving contact with solvents or oils | 9*, 10*, 11ABC†, 12ABG†, 13ABC†, 11A (R)†, 12A (R)†, 15A (R), 18ABC†, 19ABC†   |
| x)     | Solvent, oils and grease  | General chemical hazards involving contact with solvents or oil                               | 9*, 10*, 11BG†, 12BG†, 13BG†, 17BC†, 18BC†, 19BG†                              |
| xii)   | Electrolytic deposition   | Plating and subsequent operation  | 9*, 10*, 11A (R)†, 11 ABC†, 12A (R)†, 12ABG†, 13A (R)†, 13ABG†, 18ABC†, 19ABG† |
| xiii)  | Hot alkaline cleaning bath  | —   | 9*, 10*, 12A (R)†, 12ABC†, 13ABC†, 15ABC†, 19ABG†                              |
| xiv)   | Spraying paints or cellulose lacquers   | —   | 1, 8, 10*, 11BC†, 12BC†, 17BC†, 18BG†  |
| xv)    | Special hazards : lead tetra-ethyl, mercury lead salts  | —   | 9*, 12ABC†, 13ABC†   |
| xvi)   | Electric shock  | —   | See IS : 4770-1968‡  |

\*Will be covered in Part II of the standard.

†Will be covered in Part III of this standard. Letters A, B and G refer to the type of material used in making rubber gloves. Letter R indicates reinforced.

‡Specification for rubber gloves for electrical purposes.



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